

REMARKS

Claims 1-9 are pending in this application. By this Amendment, claims 1 and 3-9 are amended. Support for amendments to claims 5 and 8 can be found in original claim 1.

Claims 1, 3, 4, 6, 7 and 9 are amended for form. Thus, no new matter is added.

Applicant appreciates the courtesies shown to Applicant's representatives by Examiner Ruthkosky in the March 13, 2008 personal interview. Applicant's separate record of the substance of the interview is incorporated into the following remarks.

I. The Claims Define Patentable Subject Matter

Claims 5 and 8 are rejected under 35 U.S.C. §102(b) over U.S. Patent No. 5,350,643 to Imahashi et al. ("Imahashi"); and claims 1-4, 6, 7 and 9 are rejected under 35 U.S.C. §103(a) over Imahashi. The rejections are respectfully traversed.

Imahashi does not teach or suggest every feature of independent claims 1, 5 and 8. Imahashi does not disclose "wherein a volume of pore space of the hydrogen electrode-side catalyst layer has a range of 1.0% to 3.0% of a total volume of the catalyst layer," as recited in independent claim 1, and as similarly recited in independent claims 5 and 8.

The Office Action, at page 6, lines 10-11, acknowledges that Imahashi does not disclose this feature. However, the Office Action asserts that Imahashi, at column 4, lines 30-40 and column 6, discloses that the pore space of the hydrogen electrode is lower than that of the oxygen electrode; and asserts that it would have been obvious to one of ordinary skill in the art at the time of the invention was made to adjust the volume of pore space of the hydrogen electrode-side catalyst layer to account for 1.0% to 3.0% of a total volume of the catalyst layer, in order to adjust the flow of the fuel and oxidant gasses to the electrodes (see Office Action, page 6, lines 10-11). These assertions are respectfully traversed.

To establish a *prima facie* case of obviousness, the Office Action must at least demonstrate that there is some suggestion or motivation to modify the reference. See MPEP

§2143. The mere fact that references can be modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *See In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). Even if a device "may be capable of being modified to run the way the apparatus is claimed, there must be a suggestion or motivation in the reference to do so." *Id.* at 682.

Contrary to the Office Action's assertions, one of ordinary skill in the art at the time of the invention would not have been motivated to modify Imahashi, so as to adjust the volume of pore space of the hydrogen electrode-side catalyst layer to account for 1.0% to 3.0% of a total volume of the catalyst layer. Applicant respectfully asserts that the specification of the current application suggests the criticality of the volume of pore space of the hydrogen electrode-side catalyst layer having a range of 1.0% to 3.0% of a total volume of the catalyst layer. For example, the current specification of the current application demonstrates that suppression of direct combustion reaction and generation of hydrogen peroxide is obtained in the present invention when the volume of pore space of a hydrogen electrode-side catalyst layer accounts for 3% of the total volume of the catalyst layer at page 3, lines 20-24, page 4, line 24 - page 5, line 4, and page 8, lines 11-17 and Figs. 2 and 3. Thus, it would not have been obvious for one of ordinary skill in the art to modify Imahashi to have a volume of pore space of the hydrogen electrode-side catalyst layer to have a range of 1.0% to 3.0%.

Further, Imahashi fails to teach or suggest modifying the preferred porosity of 35%-65% to the claimed range of 1.0% to 3.0% of actual volume. Imahashi is concerned with "preventing the flooding phenomenon at the interface between the oxygen electrode and the electrolyte membrane," (see Imahashi, Abstract). Imahashi, at column 6, lines 44-48, specifically discloses that "the porosity has a proper range and according to the investigation by the inventor this is preferably about 35% to 60% for the hydrogen electrode and is about 40-65% for the oxygen electrode." Imahashi not only provides the preferred porosity of 35%

to 60% for the hydrogen electrode, but also, states that "it is important to increase the porosity and feed a sufficient amount of gas," (see Imahashi, col. 6, lines 34-35). Further, Imahashi suggests that reducing the porosity of electrode would cause insufficient diffusion of gas, which would prevent the electrode reaction (see Imahashi, column 6, lines 36-39).

However, the current application is aimed to reduce the amount of hydrogen that permeates through an electrolyte membrane. According to the current application, the reduction of the amount of hydrogen that permeates through an electrolyte membrane would suppress the direct combustion reaction with hydrogen and the amount of hydrogen peroxide to be generated, thereby improving fuel cell service life (see the specification, page 3, lines 20-24). A hydrogen electrode-side catalyst layer that has a volume of port space with a range 1.0% to 3.0% of a total volume of the catalyst layer, as recited in the independent claims, helps to reduce the amount of hydrogen. Thus, the proposed modification would render Imahashi being modified unsatisfactory for its intended purpose, because Imahashi teaches that reducing the porosity of electrode would cause insufficient diffusion of gas, and would thus prevent the electrode reaction (see Imahashi, col. 6, lines 36-39). Accordingly, Applicant respectfully submits that there would have been no suggestion or motivation to modify Imahashi as asserted by the Office Action. (see MPEP §2143.01).


Thus, for at least these reasons, claims 1, 5 and 8 are patentable over Imahashi. Further, claims 2-4, 6, 7 and 9, which variously depend from independent claims 1 and 5 are also patentable over Imahashi for at least the reasons discussed above with respect to independent claims 1 and 5, as well as for the additional features they recite. Withdrawal of the rejections is thus respectfully requested.

II. Conclusion

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 1-9 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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Attachments:

Request for Continued Examination
Petition for Extension of Time

Date: March 28, 2008

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